

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE

		132AFM02A		
PRESSURE TRANSDUCER FEEDWATER SUPPLY, ITEM 132A ----- SV767793-7 (1)	2/2	Drifts low. Pressure increase in the sensor reference cavity due to leakage through the case or sensing element. Failure of the potentiometer linkage due to increased friction. Mechanical shock loading of the linkage which causes a misalignment of the resistive element relative to the wiper. Failure of the resistive coil due to an opening on the high voltage side of the coil.	END ITEM: False indication of low gas reservoir pressure. GFE INTERFACE: Sensor 132B provides redundant pressure reading. Unable to detect when on reserve water. MISSION: Terminate EVA. Loss of use of one EMU. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Days. TIME REQUIRED: Minutes. REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - -5 Conrac and -7 Gulton: The sensing element is made of an all welded solution hardened Inconel diaphragm to maximize strength and reduce any shift due to over stressing. All linkage/resistive element attaching screws are potted in place to prevent shifting. The assembly is vacuum outgassed and temperature cycled until stable. The sensor design minimizes sensor output shifting, increase in friction and excessive resistive element wiper wear. The vacuum reference cavity is hermetically sealed in an all metal/glass, welded/ brazed case. B. Test - Component Acceptance Test - Conrac: The sensor is subjected to acceptance testing per Conrac procedure ATP451379-64 prior to shipment by the assembly vendor. This testing includes the following tests to insure the sensor is stable: The sensor is subjected to random vibration testing (6.1 grms) to insure there are no workmanship or material problems that would cause the voltage to shift low. The sensor is subjected to calibration testing at high and low temperature (30 to 120 degrees F) to insure there are no defects that thermal expansion/contraction would uncover. The sensor is calibration checked during acceptance testing to insure sensor is stable and proof pressure tested for one minute at 24 psia to insure pressure stability. Gulton: The sensor is subjected to acceptance testing per Gulton procedure ATP 3031-15201 prior to shipment by the assembly vendor. This testing includes the following tests to insure the sensor is stable: The sensor is subjected to random vibration testing (6.1 grms to insure there are no workmanship or material problems that would cause the voltage to lower. The sensor is subjected to calibration testing at low temperature to insure there are no defects that thermal expansion/contraction would uncover. The sensor is calibration checked during acceptance testing to insure sensor is stable and proof pressure tested for one minute at 24 psia to insure pressure stability. PDA Test - The sensor is calibration checked at 0 and 16.0 psia as assembled on the PLSS to insure the output voltage is within spec limits per SEMU-60-010, Test 27. Certification Test - Certified for a useful life of 20 years (ref. EMUM1-0084). C. Inspection - Inspection - Conrac: The sensor is visually inspected prior to case assembly to insure there are no workmanship problems which could cause the output voltage to shift low. The sensor is calibration checked at various steps in the assembly process to insure the sensor output is within specified limits. Gulton: The sensor is visually inspected prior to assembly to insure there are no workmanship problems which could cause the output voltage to shift low. The sensor is calibration checked at various steps in the assembly process to insure the sensor output is within specified limits. The sensor is pressure cycled for at least 350 cycles during assembly to insure the sensor is stabilized. The sensor is temperature cycled between -65 degrees F and +200 degrees F to insure it is stable.

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132AFMO2A

D. Failure History -

The following RDR's were issued for Item 132 due to output voltage shifting low. All failures were due to leakage of ambient gas into the reference cavity due to cracking of the glass connector. The connectors have been changed to individual glass bead connectors which are more reliable:

- A. EMU-132-C001, 02/19/78
- B. EMU-132-C002, 03/09/79
- C. EMU-132-C003, 01/29/80
- D. EMU-132-C004, 01/29/80
- E. EMU-132-D001, 06/11/79
- F. H-EMU-132-S001, 06/06/80
- G. J-EMU-132-C001, 10/08/80

E. Ground Turnaround -

Tested for non-EET processing per FEMU-R-001, Transducer and DCM Gage Calibration Check. FEMU-R-001 Para 8.2 EMU Preflight KSC Checkout for EET processing.

F. Operational Use -

Crew Response -

EVA: When CWS data confirms loss of feedwater gas pressure, trouble shoot problem. If failure can be determined to be sensor, continue EVA.

Training - Standard EMU training covers this failure mode.

Operational Considerations - No constraints for single failure. Flight rules define go/no go criteria related to EMU suit thermal control. EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-132 FEEDWATER SUPPLY PRESSURE SENSOR
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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